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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,056	12/27/2001	Ming-Yau Chern	JCLA8425	3244

7590

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EXAMINER

PRITCHETT, JOSHUA L

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/035,056

Applicant(s)

CHERN ET AL.

Examiner

Joshua L Pritchett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohaty (US 6,264,858).

Regarding claim 1, Bohaty teaches a nonlinear optical material comprising bismuth film (col. 4 lines 55-56) capable of producing nonlinear optical effects (col. 4 lines 46-47). Bohaty teaches that the optical coefficients are nonlinear and refraction and absorption are both well known optical coefficients. Bohaty discloses that the bismuth layer (col. 4 lines 6-8) has nonlinear optical coefficients. Bohaty lacks specific reference to non-linear refraction and non-linear absorption. It would have been obvious to a person of ordinary skill to have the non-linear "well known optical coefficients" be refraction and absorption for the purpose of converting the radiation of the incident light from one wavelength to another.

Regarding claim 7, Bohaty teaches the bismuth film disposed on a base layer (col. 4 lines 51-56). Bohaty discloses the use of bismuth as a thin layer on a glass fibre for the purpose of frequency conversion.

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Regarding claim 8, Bohaty teaches the base layer comprising glass (col. 4 lines 51-56).

Bohaty discloses the base layer being a glass fibre.

Regarding claim 10, Bohaty teaches the bismuth film used for radiation conversion (col. 4 lines 18-22).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohaty in view of Takenaka (US 5,602,079).

Bohaty teaches the use of a bismuth oxide (col. 2 line 36). Bohaty teaches the invention as claimed but lacks pulse-laser deposition of the bismuth compound. Takenaka teaches the use of pulse-laser deposition of superconductor oxides on a substrate (col. 4 lines 44-46). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use pulse-laser deposition as thought by Takenaka to create the bismuth layer taught by Bohaty for the purpose of rapid creation of the layer and the ability to readily control the thickness of the bismuth layer.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohaty.

Bohaty discloses the claimed invention except for the bismuth layer having a thickness of approximately 10.5 nanometers. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the thickness of the Bohaty layer 10.5 nanometers, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to make the

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thickness of the Bohaty layer 10.5 nanometers for the purpose of using less material and thereby creating the product in a more cost effective manner.

Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohaty in view of Hed.

Bohaty teaches the invention as claimed but lacks reference to a top protective layer on the bismuth layer. Bohaty further lacks reference to the use of a transparent protective layer or the use of aluminum oxide as the protective layer. Hed teaches the addition of a transparent top protective layer to cover the bismuth layer (col. 6 lines 30-31). Hed further teaches that aluminum oxide is known as a transparent protective layer (col. 7 lines 21-22). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the transparent aluminum oxide protective layer taught by Hed to protect the bismuth layer of Bohaty for the purpose of creating an inexpensive durable optical member.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohaty in view of Hed as applied to claim 7 above, and further in view of Wang (US 6,106,948).

Snow in combination with Hed teaches the invention as claimed but lack reference to a quartz base layer. Wang teaches the use of a quartz base layer in a nonlinear optical structure (col. 3 lines 48-50). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use quartz as the base layer as taught by Wang of the optical

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material taught by ~~the combination of Bohaty and Hed~~ for the purpose of creating an optical material with good transparency.

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L Pritchett whose telephone number is 703-305-7919. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1687. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JLP  
November 4, 2002



Cassandra Spyrou  
Supervisory Patent Examiner  
Technology Center 2800